

## **HYDROGEOLOGY OF THE SEDIMENTARY AQUIFERS OF MULLAITIVU, SRI LANKA**

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Coastal belt of the north eastern part of the Sri Lanka is covered with Miocene to recent sediments, overlying the basement. A sedimentary aquifer system is present within these sediments. The present study was carried out to find the types of aquifers, their distributions, water quality of them and their hydraulic characteristics from Paranthan to Nayaru in part of Mullaithivu and Kilinochchi districts.

Geological well logging of 57 tube wells are used to prepare geological and hydrogeological cross sections. Water types of the aquifers and their chemical qualities are identified by the analysis of 33 water samples. Pumping tests of the 13 tube wells were carried out and analyzed to determine the transmissivity of the different aquifers.

Within the study area, three main aquifer types are present namely hard rock, limestone and sand. Hard rock aquifers are associated with fractures in Garnetiferous granitic gneiss and have calcium - magnesium - bicarbonate type water. Transmissivity of the hard rock aquifer is varied in the range of 10 – 50 m<sup>2</sup>/day. EC of the hard rock aquifer is moderate to high. Limestone aquifer is associated with interconnected cavities system and have sodium - potassium - bicarbonate, sodium – potassium - chloride - sulphate, and calcium – magnesium - bicarbonate type water. Transmissivity of the limestone aquifer is higher as about 100 m<sup>2</sup>/day. EC of the limestone aquifer is moderate to high. Saline water intrusions can be possible due to the over extraction from this aquifer. Fresh limestone aquifer is restricted up to about 30 -40m depth.

Two main types of sandy aquifers are present namely shallow unconfined aquifers and deep confined aquifers with low to moderate EC values. Sandy aquifer have sodium – potassium - bicarbonate and sodium – potassium – chloride - sulphate type water. Within the confined sandy aquifer area, three main sandy confined aquifer zones are present with different aquifer parameters. They are Nandikadal, Pudukudirippu and Nayaru basins. Nandikadal basins also divided to two sub basins namely Nandikadal- north basin and Nandikadal- Mulliyaweli basin. Transmissivity is between 75 – 85 m<sup>2</sup>/day in Nayaru basin, between 300 - 310 m<sup>2</sup>/day in Pudukudirippu basin and between 75 – 100 m<sup>2</sup>/day in Nandikadal- north basin. All measured chemical parameters (except Fe) in sandy aquifers are within the SLS limits. Fe in groundwater of this aquifer is increased gradually with the effect of pumping and with the long term usage. Therefore extensive pumping over long period of time may decreased the quality of water (Fe).